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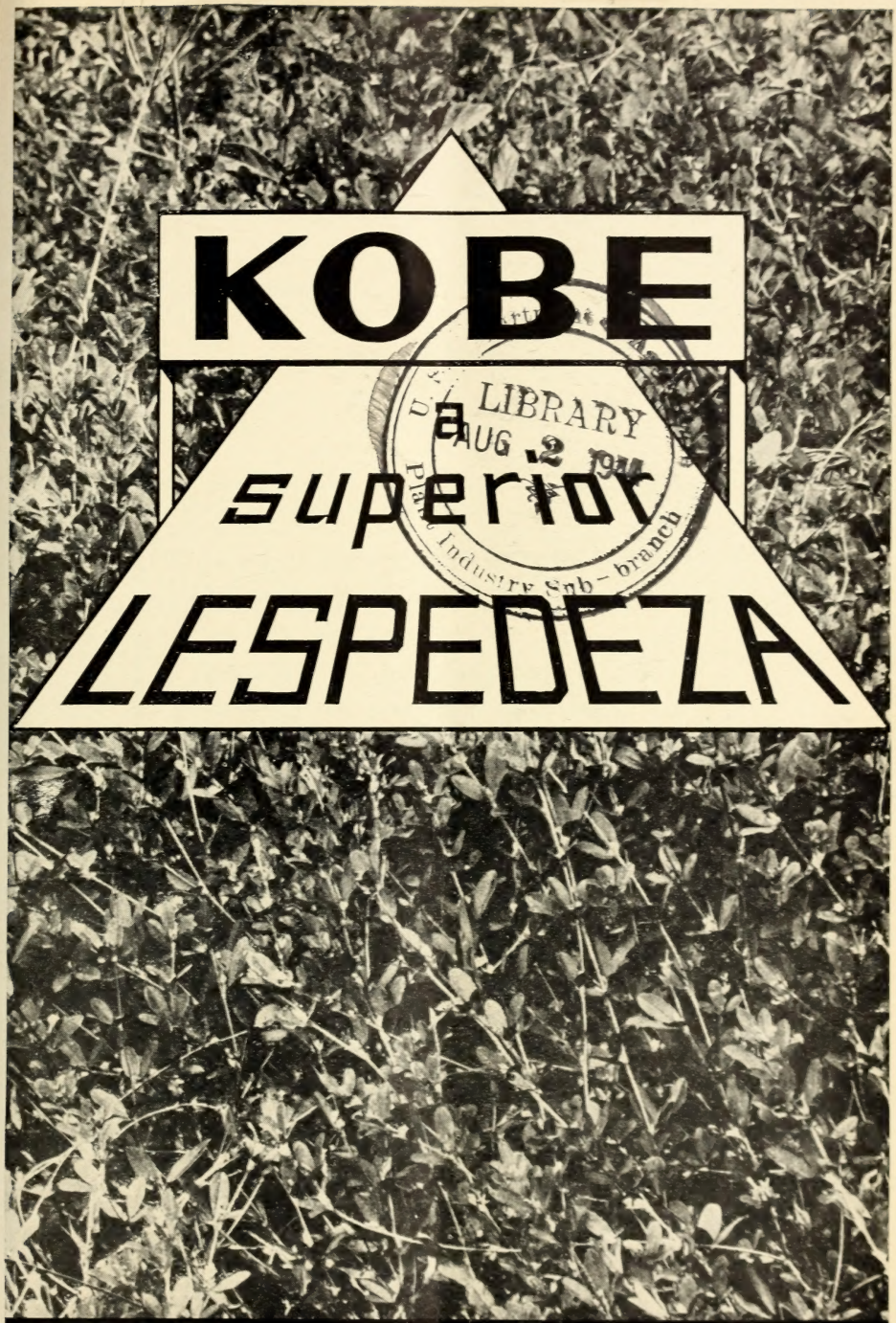

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U.S. DEPARTMENT OF AGRICULTURE

THE NEED for improving crop and livestock production and increasing the income of the southern farmer makes it desirable that the superior merits of Kobe lespedeza as a forage legume be more widely known.

Washington, D. C. July 1944

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KOBE, A SUPERIOR LESPEDEZA

By ROLAND MCKEE, *senior agronomist*, and HOWARD L. HYLAND, *associate agronomist, Division of Forage Crops and Diseases, Bureau of Plant Industry, Soils, and Agricultural Engineering, Agricultural Research Administration*

THE LONG-FELT NEED for a good late-season legume for southern pastures can now be well met by growing Kobe lespedeza. This is an improved large-growing, late-maturing variety of common lespedeza. The large growth assures increased yields of hay, and late maturity extends the pasturing season and provides nutritious feed at a time of scarcity. Possessing these characteristics, Kobe can play an important role in programs to increase crop and livestock production. Extension of its use will help to insure adequate supplies of hay and pasture for the livestock industry in the South and increase general crop production.

Kobe lespedeza was introduced from Japan in 1919 by J. B. Norton, an explorer of the United States Department of Agriculture, who made the first experimental planting in 1920 at Hartsville, S. C. The first crop was grown in 1923 by the Coker Seed Co., and the lush and late growth indicated at once its possibilities for the southern part of the lespedeza area (fig. 1).

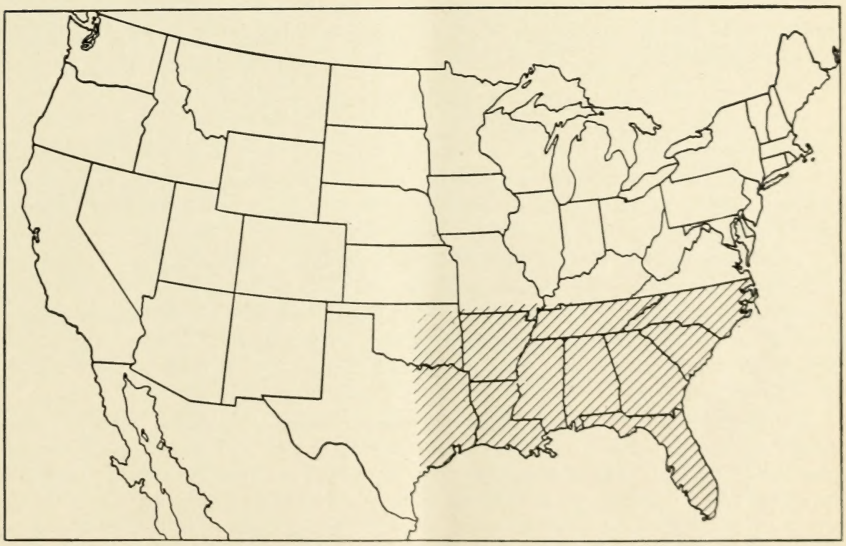

FIGURE 1.—Southern areas of the United States to which Kobe lespedeza is best adapted for increasing crop and livestock production and improving the soil.

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SPECIES ADAPTATION

Two species of annual lespedeza are recognized. One of these (*Lespedeza stipulacea*) is the form known as Korean lespedeza. The other (*L. striata*) is made up of the unimproved form known as common lespedeza and its two improved varieties, Tennessee 76 and Kobe (fig. 2).

FIGURE 2.—Specimen plants (left to right) of Kobe, Korean, and common lespedeza, grown near Washington, D. C.

The two species differ in adaptation to latitudes, the Korean succeeding farther north and the common lespedeza and its improved varieties being more at home in southern latitudes. In the region of North Carolina and Tennessee both species are grown and do well. Natural latitudinal adaptation and other characteristics make Kobe lespedeza especially valuable to the South.

SEED CHARACTERISTICS

The seed of Kobe lespedeza is distinctly larger than that of either Tennessee 76 or common lespedeza. It will average about half again as large as in those varieties both in the pod and when hulled. Seeds of all three can be easily distinguished from those of Korean lespedeza. In that species the calyx covers less than half the seed pod, while in the other three the seed pod is almost entirely enclosed. In these three varieties very few of the calyxes are removed in threshing, while in Korean about 75 percent are removed. The calyx of Kobe is grayish green, while that of common and Tennessee 76 is generally reddish brown (fig. 3).

On account of the large calyx, seeds of Kobe, Tennessee 76, and common lespedeza weigh less than those of Korean and average about 25 pounds a bushel. In Kobe the number of seeds to the pound is about 200,000, while in Tennessee 76 and common it runs about 300,000 .

SEEDING

Kobe seed being larger, more seed by weight should be used than is required for Tennessee 76 or common lespedeza. For average condi-

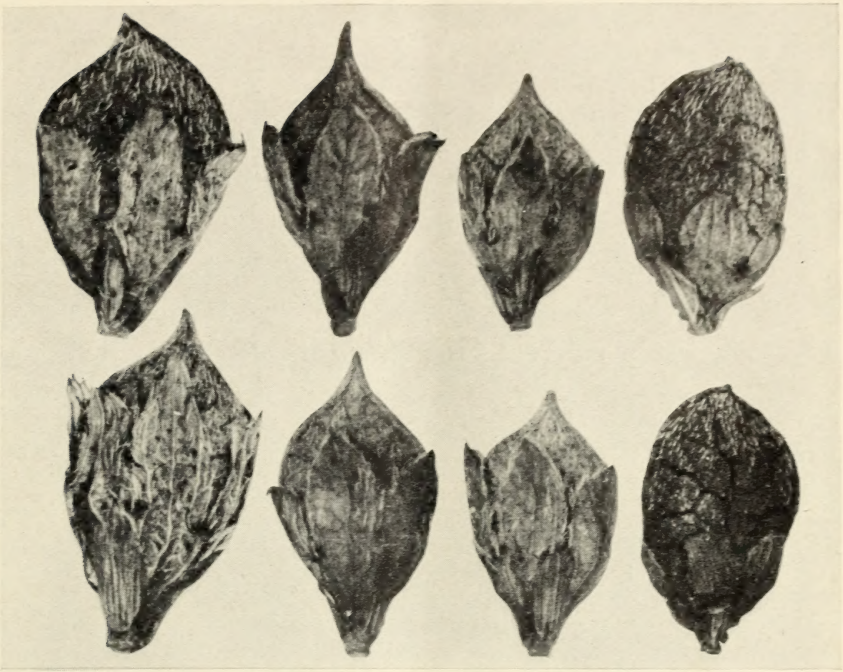

FIGURE 3.—Lespedeza seed, showing varietal differences in size and calyx characteristics. From left to right: Kobe, Tennessee 76, common, and Korean.

tions, up to 30 pounds an acre is recommended for Kobe, while 20 pounds is enough for the other varieties. Inoculation of the initial crop has proved beneficial and is recommended.

Seedings of all annual lespedeza varieties can be made in the South at any time from February to April.

A well-prepared and firmed seedbed will help insure a good stand and make it possible to reduce the rate of seeding. A cultipacker or roller used immediately following broadcast seedings is added insurance for good stands. When a drill is used the seedbed should be firmed before seeding and the seed drilled very shallow. Good seeding practices save seed and money, and in times of shortage they make it possible to sow a larger acreage with the seed that is available.

With fall-seeded grain the lespedeza seeding should be made as early in the following spring as weather conditions will permit, in order that the growth of the grain may not seriously interfere with the seeding and establishment of the lespedeza.

Usually the lespedeza seed is broadcast with a hand seeder and no attempt is made to cover the seed. Sometimes a disk grain drill is used, with the disks so set as to make a shallow cut and provide just enough loose soil to cover the seed. Before seeding in meadows and pastures it is desirable to renovate the sod by disking or harrowing. The heavier sods will require more intensive working with disk or harrow, to insure the establishment of the lespedeza. In pastures or meadows where lespedeza is being maintained, clovers or other strong-growing winter annuals should not be seeded, as their heavy spring growth will crowd out the lespedeza.

FERTILIZERS AND LIME

On poor soils the use of commercial fertilizers increases the growth of all varieties of lespedeza. Usually superphosphate is the fertilizer most needed, but on some soils potash has given increased yields as also has nitrogen. Nitrogen is seldom needed on the more fertile soils. On poor soils a complete fertilizer of 4–12–4 or some similar formula will give good results. On acid soils lime will benefit lespedeza. Land that has been adequately limed for other crops, however, will not need additional lime for lespedeza. In experimental work the use of lime has increased the growth of Korean more than that of Kobe, indicating that the Kobe is better adapted to more acid conditions.

SEED PRODUCTION

Kobe lespedeza, like Tennessee 76 and common, shatters very readily when ripe, making seed harvesting difficult. For this reason seed yields are smaller for these varieties than for Korean, which has better seed habits.

To obtain maximum seed yields of Kobe lespedeza it is necessary to use a seed pan on the cutter bar and to cut at the proper stage of maturity. By taking advantage of weather conditions and by harvesting when dew is on the plants, shattering can be avoided to some extent. Harvesting can be done with a combine, but considerable seed will be lost by this method.

VARIETAL ADAPTATION

The unimproved form, or common lespedeza, and its two improved varieties, Kobe and Tennessee 76, differ in growth habit and adaptation. Tennessee 76 is the most upright of the three, and common lespedeza the most prostrate. Kobe is intermediate, tending to be more upright.

The three forms of this species may be further distinguished from Korean lespedeza by the pubescence, or hairs, on the stems. In Kobe and other varieties of this species the hairs point downward and uniformly cover the stem. In the Korean species they point upward, are less abundant, and occur only on the side of the stem opposite the leaf axis (fig. 4).

In tests and plantings throughout the South, Kobe has been considered superior to Tennessee 76 and common lespedeza for general use under cultivation; consequently it has been the most extensively planted.

In addition to its natural adaptation to the South, Kobe lespedeza is late in maturing, and this quality extends the grazing season. It also brings the hay or bloom stage of the plant at a season when rainfall is low and conditions for haymaking are advantageous.

The growth of Kobe in the lower South is likewise more luxuriant than that of Korean, and according to preliminary investigations and observations it is less damaged by nematodes, a pest that does serious damage to many legumes on the dry sandy upland soils of the Coastal Plain.

VALUE FOR PASTURAGE

Perhaps no plant is doing more or has possibilities of doing more for the livestock industry of the South than lespedeza. This legume supplies nutritious feed during that part of the season when grass

pastures are usually deficient. Experiments at several State experiment stations show substantial increases in weight among livestock on lespedeza pastures.

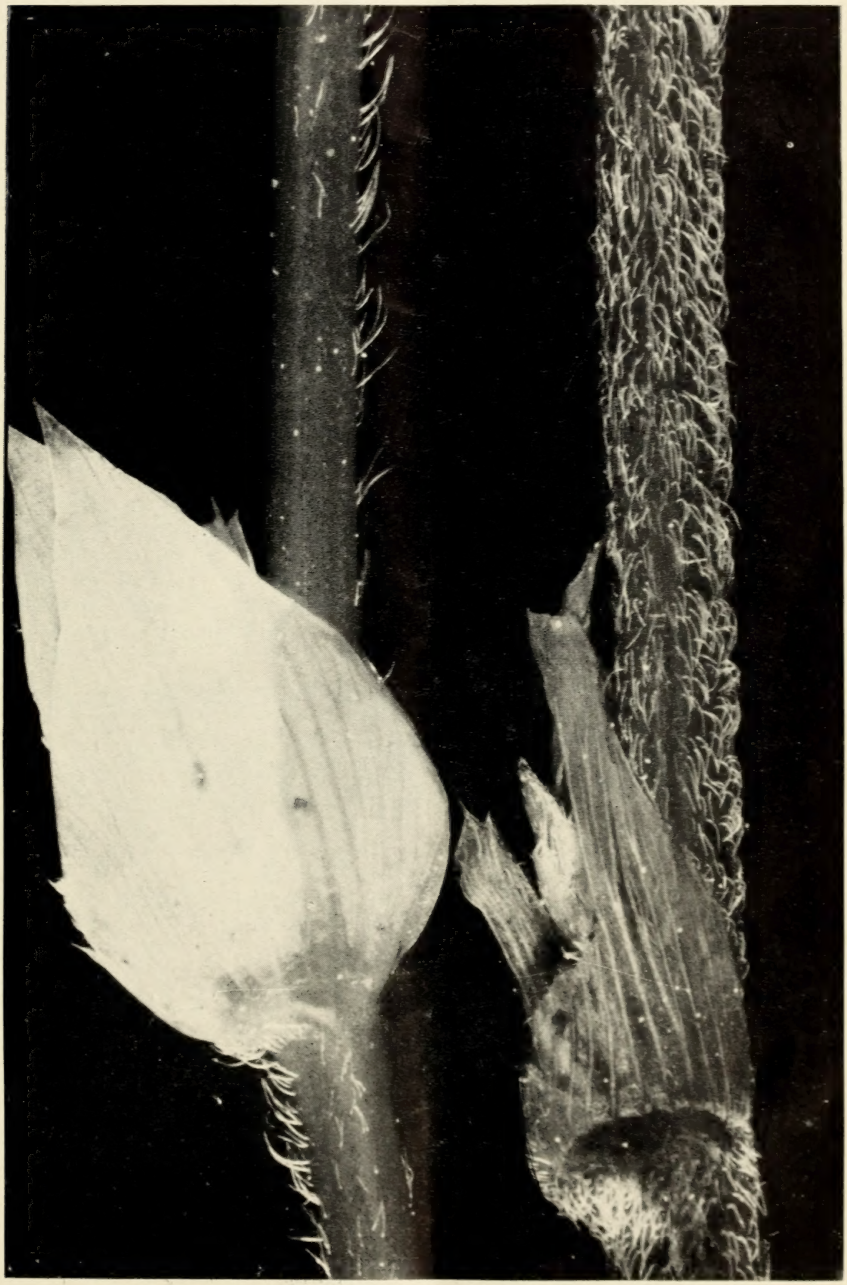

FIGURE 4.—Sections of stems of Korean and Kobe lespedeza, showing difference in pubescence: Korean (left), Kobe (right).

At Tifton, Ga., over a period of 9 years, common lespedeza following oats has furnished good pasture from about June 15 to the latter part of October, with average gains of 100 pounds of beef per acre. At Grain Valley, Mo., the use of Korean lespedeza to supplement permanent pasture during midsummer and early fall has resulted in gains of 122 percent. Similar results have been obtained at other experiment stations.

While the use of any variety of annual lespedeza improves the quality of pasturage and lengthens the grazing season, the use of Kobe will give maximum returns both in quantity of production and in number of grazing days. The late maturing of Kobe insures better feed late in summer and in fall, when good pasturage usually is scarce.

Common lespedeza, according to some observers, is able to persist with grasses in closely grazed pastures better than the more upright-growing varieties, and for this reason it is often recommended for use in permanent pastures. This may be an advantage in some cases, but in most situations Kobe lespedeza will reseed, and even if occasionally artificial reseeding has to be resorted to, it is justified by the larger growth and yield of the Kobe.

In temporary pastures or in pastures used in rotations Kobe is decidedly superior to common lespedeza, and except in closely grazed pastures it will give greater yields.

ROTATIONS AND SOIL IMPROVEMENT

Lespedeza is an excellent soil-improving crop. It can be used directly as a green-manure crop or as a crop in the rotation. For the best results, crop residues should not be turned into the soil until shortly before planting a succeeding crop. Lespedeza fits well into a rotation with small grain, and such a rotation provides a continuous ground cover that prevents leaching of plant food and reduces loss of soil by erosion. Such a rotation also fits in well with livestock production, and if the lespedeza is pastured or both the grain and lespedeza are pastured, soil fertility is less depleted than by other methods of utilization.

A small-grain crop and lespedeza may be used in rotation with cotton, corn, peanuts, soybeans, and other summer crops. By proper adjustment the balance between pasture and crop production can be maintained to accommodate the number of livestock on the farm.

When the entire lespedeza crop is used for green manure, any of the annual varieties may be used. When a rotation brings livestock into the picture, the season of production as well as the total production becomes a consideration. It is in such circumstances that the Kobe variety, by reason of its large growth and late maturity, is superior.

HAY

Lespedeza makes good hay, and feeding experiments prove it to be but little inferior to alfalfa. For best-quality hay the crop should be cut early; never later than full bloom. Kobe, being a large-growing variety, gives maximum yields. All the annual lespedezas cure quickly, which is particularly an advantage for a hay crop in the South.

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